IT IS CLAIMED:

1. A method of screening test compounds as candidates for treating or preventing ischemia-related cellular damage, comprising

subjecting a substantially homogeneous primary culture of excitable cells to an oxygen/glucose deprivation challenge sufficient to produce cell death in at least 25% of the challenged cells, when examined at a selected time after the challenge,

exposing said cells to one or more test compounds to be screened,

examining the cells at such selected time after challenge for the presence of cell death, and

selecting the test compound as a candidate for treating ischemia-related cellular damage if the percentage of dead cells in the test culture is substantially less than that of a control culture.

2. The method of claim 1, wherein said primary excitable cells are at least about 80% homogeneous in culture.

3. The method of claim 1, wherein said primary excitable cells are at least about 95% homogeneous in culture.

4. The method of claim 1, wherein said primary excitable cells are at least 99% homogeneous in culture.

5. The method of claim 1, wherein said excitable cells are retinal ganglion cells.

6. The method of claim 1, wherein said excitable cells are cardiac myocytes.

7. The method of claim 1, wherein said examining is for the presence of apoptosis-related cell death.

8. The method of claim 1, wherein said examining is for the presence of necrotic cell

death.

9. The method of claim 1, wherein said examining is for the presence of non-apoptotic, non-necrotic cell death.

10. The method of claim 1, wherein the test compound is a calcium channel blocker.

11. The method of claim 1, wherein the test compound is an NMDA receptor antagonist.

12. The method of claim 1, wherein the test compound is a bis-benzimidazole

13. The method of claim 1, wherein said ischemia-related cellular damage is neuronal ischemia.

14. The method of claim 13, wherein said ischemia-related cellular damage is retinal neuronal damage associated with glaucoma.

15. The method of claim 13, wherein said ischemia-related cellular damage is neuronal cell damage in the central nervous system associated with cerebral ischemia.

16. The method of claim 1, wherein said ischemia-related cellular damage is myocardial damage associated with myocardial infarction.

17. A method of treating ischemia-related neuronal damage, comprising administering to a subject, a therapeutically effective amount of a non-peptide compound effective to reduce cell death in retinal ganglion cells subjected to an ischemic challenge, as evidenced by the ability of the compound to significantly reduce the percentage cell death of retinal ganglion cells in substantially homogeneous primary culture, when the cells are subjected to oxygen/glucose deprivation challenge.

18. The method of claim 17, wherein said ischemia-related neuronal damage is associated with glaucoma.

19. The method of claim 17, wherein said ischemia-related neuronal damage is associated with cerebral ischemia.

20. A method of screening compounds as candidates for treating glaucoma, comprising subjecting a substantially homogeneous primary culture of neuronal cells to a growth factor and/or an oxygen/glucose deprivation challenge sufficient to produce cell death in at least 25% of the challenged cells, when examined at a selected time after the challenge, exposing said cells to one or more test compounds to be screened, examining the cells at such selected time after challenge for the presence of cell death, and selecting the test compound as a candidate for treating glaucoma if the percentage of dead cells in the test culture is substantially less than that of a control culture.

21. The method of claim 20, wherein said culture is a primary culture of retinal ganglion cells characterized by about 99% homogeneity.

22. The method of claim 20, wherein said examining is for the presence of apoptosis-related cell death.

23. The method of claim 20, wherein the test compound is selected from the group consisting of calcium channel blockers, NMDA receptor antagonists and bis-benzimidazoles.

24. A method of treating glaucoma, comprising administering to a subject, a therapeutically effective amount of a compound effective to reduce cell death in a substantially homogeneous primary culture of retinal ganglion cells subjected to a growth factor and/or an oxygen/glucose deprivation challenge, as evidenced by the ability of the compound to significantly reduce the percentage cell death of retinal ganglion cells in culture, when the cells are subjected to a growth factor and/or an oxygen/glucose deprivation challenge.

25. The method of claim 23, wherein said primary culture is characterized by at least 99% homogeneity.

26. A method of treating a neurodegenerative disease, comprising administering to a subject, a therapeutically effective amount of a non-peptide compound effective to reduce cell death in retinal ganglion cells subjected to a growth factor and/or an oxygen/glucose deprivation challenge, as evidenced by the ability of the compound to significantly reduce the percentage cell death of retinal ganglion cells in culture, when the cells are subjected to a growth factor and/or an oxygen/glucose deprivation challenge.